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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/750,583	12/31/2003	Hong Jiang	ITL.1704US (P17510)	8582
21906 7590 11/23/2007 TROP PRUNER & HU, PC 1616 S. VOSS ROAD, SUITE 750 HOUSTON, TX 77057-2631			EXAMINER WAI, ERIC CHARLES	
			ART UNIT 2195	PAPER NUMBER
			MAIL DATE 11/23/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/750,583

**Applicant(s)**

JIANG ET AL.

**Examiner**

Eric C. Wai

**Art Unit**

2195

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 31 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>3/31/2005</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

1. Claims 1-18 are presented for examination.

### ***Double Patenting***

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-18 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-5, 12-13, 19-22, 26-27, and 33-34 of copending Application No. 10/750,589. Although the conflicting claims are not identical, they are not patentably distinct from each other.
4. For example, claim 1 of copending Application No. 10/750,589 recites placing a thread in an inactive state in response to a predetermined condition and sending a

message from a semaphore to change the state of the thread. Claim 1 of the present application performs the substantially the same steps. Claim 1 of copending Application No. 10/750,589 differs only in that the threads are intended to be used to process graphical elements of an image.

5. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. The following terms are not clearly understood:

i. Claim 1 recites, "sending a message from a semaphore". It is unclear whether this message is sent all the time or when at least one of the predetermined conditions is resolved. Furthermore, it is unclear whether the predetermined conditions of line 3 are related to semaphore of line 4. Lines 4-5 recites, "to execute the thread of instructions to change a state of the thread of instructions from the inactive state". It is unclear

whether the thread of instructions performs the state change or whether executing the thread of instructions indicates a state change.

- ii. Claim 8 is rejected for the same reasons as claim 1.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kwok et al. (US Pat No. 5,951,672 hereinafter Kwok) in view of Wenniger (US Pat No. 6,018,785).

10. Wenniger was disclosed on IDS dated 3/31/2005.

11. Regarding claim 1, Kwok teaches a method comprising:

placing an executable thread of instructions in an inactive state in response to detection of at least one of a set of predetermined conditions (col 4 lines 35-44, wherein the first thread is in a waiting state after testing variables linking the two threads);

resuming execution of the first thread of instructions in response to the semaphore entity (col 4 lines 35-44, wherein the task is executed).

12. Kwok does not teach sending a message from a semaphore to control circuitry to execute the thread of instructions to change a state of the thread of instructions from the inactive state. However, Wenniger teaches using an active semaphore to generate an interrupt signal whenever a semaphore status changes (col 6 lines 1-22). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kwok to use an active semaphore. One would be motivated by the desire to reduce unnecessary resource usage caused by continuous polling of passive semaphores as indicated by Wenniger (col 6 lines 10-12).

13. Regarding claim 2, Kwok teaches that changing the state of the thread of instructions from the inactive state comprises changing the state of the thread of instructions to an active state (col 4 lines 33-44, wherein the task goes from waiting to executing).

14. Regarding claim 3, Kwok teaches executing the thread of instructions when in the active state (col 4 lines 33-44, wherein the task is being executed).

15. Regarding claim 4, Kwok teaches that the set of predetermined conditions comprises an unresolved dependency (col 3 line 64 to col 4 line 11, wherein there is an unresolved dependence on the work buffer).

16. Regarding claim 5, Wenniger teaches wherein the set of predetermined conditions comprises a response from the semaphore indicating that a resource corresponding to the semaphore is unavailable (col 6 lines 12-16, wherein process B must wait for receipt of the interrupt).

17. Regarding claim 6, Kwok teaches maintaining an indication of a state of each of a plurality of executable threads of instructions (col 4 lines 1-11, wherein state variables for each thread are consulted).

18. Regarding claim 7, Kwok teaches that the indication of the state of each thread comprises a state variable corresponding to a dependency, if any, of an associated thread (col 4 lines 1-11, wherein state variables for each thread are consulted).

19. Regarding claims 8-10, they are the apparatus claims of claims 1, 6, and 10 above. Therefore, they are rejected for the same reasons as claims 1, 6, and 10 above.

20. Claims 11-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wenniger (US Pat No. 6,018,785).

21. Regarding claim 11, Wenniger teaches an apparatus comprising:

an execution circuit to receive and execute a thread of instructions, wherein the execution circuit transmits a semaphore request message and places the thread in an inactive state in response to the thread of instructions requiring a resource having an associated semaphore (col 6 lines 12-22, wherein the requesting process must await an interrupt from the semaphore); and

a semaphore entity coupled with the execution circuit to receive the semaphore request message from the execution circuit and to selectively grant control of the semaphore in response to the semaphore request message by transmitting a semaphore acknowledge message to the execution circuitry, wherein the execution circuitry, in response to receiving the semaphore acknowledge message, removes the thread of instructions from the inactive state (col 6 lines 12-22, where upon receiving the interrupt, the thread queries the semaphore).

22. Wenniger does not explicitly teach that the thread of instructions is placed in an inactive state. Wenniger only teaches that the thread awaits the interrupt from the hardware semaphore. However, it would have been obvious to one of ordinary skill in the art at the time of the invention, that the thread would be placed in an inactive state. It is well known in the art that threads are stalled when the resources that they require are unavailable. One would be motivated by the desire to reduce idle execution time of threads awaiting resources as is well known in the art.

23. Regarding claim 12, Wenniger does not teach further comprising: at least one additional execution circuit to execute threads of instructions; and a thread dispatcher



coupled with the execution circuit and at least one additional execution circuit to dispatch threads for execution by selected execution circuits.

24. It would have been obvious to one of ordinary skill in the art, at the time of the invention to add one additional execution circuit to execute threads of instructions and a thread dispatcher. It is well known in the art to add additional execution units to increase processing capability of processors.

25. Regarding claim 13, Wenniger teaches that the execution circuitry, in response to receiving the semaphore acknowledge message, resumes execution of the thread of instructions including accessing the resource associated with the semaphore (col 6 lines 12-22).

26. Regarding claim 14, Wenniger teaches that when the thread of instructions is in the inactive state, execution of the instructions ceases and the execution circuitry does not poll the semaphore entity to determine a status of the semaphore request message (col 6 lines 6-12).

27. Regarding claims 15-18, they are the system claims of claims 11-14 above. Therefore, they are rejected for the same reasons as claims 11-14 above.

***Conclusion***

28. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric C. Wai whose telephone number is 571-270-1012. The examiner can normally be reached on Mon-Thurs, 9am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng - Ai An can be reached on 571-272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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